

It has become almost axiomatic that standard parallel OT (SP-OT) is ill-suited for the treatment of opaque processes of the form $A \rightarrow B / C _ D$, both *non-surface-true* (instances of A in $C _ D$) and *non-surface-apparent* (instances of B derived by P in environments other than $C _ D$). In particular, McCarthy (1999) claims that although some types of non-surface-true generalizations can be expressed directly in SP-OT, non-surface-apparent generalizations cannot be expressed without some “refinements” (e.g., McCarthy’s Sympathy Theory). In this talk I show that there exists an important type of heretofore unrecognized non-surface-apparent generalization, which I call *counterfactual derivation*, that can be expressed directly in SP-OT without any further refinements.

In Lithuanian, the verbal prefixes /at/ and /ap/ surface with an epenthetic vowel — as [atʲi] and [apʲi], respectively — if the initial consonant of the stem is either identical to the prefix-final consonant or differs from it only in terms of voicing or palatalization (or both).

- (1) atʲi-tʲeisʲtʲi ‘to adjudicate’ apʲi-putʲi ‘to grow rotten’
 atʲi-duotʲi ‘to give back, return’ apʲi-bʲerʲtʲi ‘to strew all over’
 cf. at-ko:pʲtʲi ‘to rise, climb up’ cf. ap-kalʲbʲetʲi ‘to slander’

The fact that vowel epenthesis appears to ignore differences in both voicing and palatalization is not accidental: the first of two adjacent consonants independently assimilates to the second in terms of voicing and palatalization in these (and other) contexts, as shown in (2) below. Thus, if a vowel were *not* epenthesized in the examples in (1) above, the expected result after the application of assimilation *would be* a pair of adjacent identical consonants in all cases.

- (2) ad-gautʲi ‘to get back’ ab-gautʲi ‘to deceive’
 atʲ-pʲjautʲi ‘to cut off’ apʲ-tʲemʲdʲi:tʲi ‘to obscure’
 adʲ-bʲekʲtʲi ‘to run up’ abʲ-gʲi:dʲi:tʲi ‘to heal (to some extent)’

Epenthesis should thus ideally be stated to apply only between identical consonants, leaving the correct outcome in all cases to be determined by the interaction with assimilation. This avoids the coincidental duplication of reference to the same features in both processes. This generalization in the statement of epenthesis is non-surface-apparent, because epenthetic vowels appear in contexts other than between completely identical consonants; to wit, they also appear between consonants that differ in terms of one or both of the features that assimilate. This requires that the conditions for the application of epenthesis be dependent on the *potentially counterfactual* application of assimilation.

In SP-OT, the derivation of a form is computed by generating and comparing multiple complete derivations (= output candidates) of that form in parallel, typically all but one of which are counterfactual (= nonoptimal). This fundamental property of SP-OT uniquely allows for the kind of ‘looking forward’ that is needed in order to properly express counterfactual derivation as just described.

(3)

Input: /ap-bʲerʲtʲi/	NO-GEM	AGREE(voi/pal)	DEP-V	IDENT(voi/pal)
a. [abʲ-bʲerʲtʲi]	* !			
b. [ap-bʲerʲtʲi]		* !		*
c. [apʲi-bʲerʲtʲi]			*	

The necessary counterfactual derivation in which assimilation applies but epenthesis does not is shown in (3a); this candidate output fatally violates NO-GEM, the constraint otherwise responsible for epenthesis between adjacent identical consonants. The faithful candidate in (3b) is not an option because that violates AGREE(voi/pal), the constraint otherwise responsible for assimilation. The only remaining option is epenthesis, the opaque candidate output in (3c). This is a completely straightforward SP-OT analysis that properly describes the non-surface-apparent generalization in question.

Although the relevant facts can be generated, counterfactual derivation itself is simply not statable in rule-ordering terms. The right result cannot be gotten with either of the two possible orders between epenthesis (stated so as to apply between identical consonants only) and assimilation.

- (4) a. Epenthesis precedes assimilation b. Assimilation precedes epenthesis
 UR /ap-bʲerʲtʲi/ UR /ap-bʲerʲtʲi/
 Epenthesis *not applicable* Assimilation [abʲ-bʲerʲtʲi]
 Assimilation *[abʲ-bʲerʲtʲi] Epenthesis *[abʲi-bʲerʲtʲi]

It isn’t clear precisely how the theory should be modified in order to correctly express this sort of rule interaction, but it must be something along the following lines: the derivation of a form must be allowed to pursue a counterfactual path, the end result of which may serve as the motivation for the application of a rule in the “real” path of the derivation that leads to the actual surface form. In other words, separate candidate forms must be derived and compared, much as they already are in SP-OT.

Reference

McCarthy, John. 1999. Sympathy and phonological opacity. *Phonology* 16, 331-399.